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THE
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Rail Road News.

Railroad Bridge.

The bridge of the Kennebec and Portland Railroad, over the Androscoggin River at Topsham, is one of the lagest and most substantial structures of the kind in the United States. It is a deck bridge, the upright posts and rods being about 18 feet from the lower to the upper deck. One of them reaching from centre to centre of the piers, is one hundred and eighty feet. The piers are of granite laid in the most durable manner. The whole length of the bridge, is over seven hundred feet. The track of the road along the upper deck will be will be about fifty feet above tide water. The large lower and upright timbers, and the iron work, together with the X work between decks, give the bridge an appearance of strength and solidity sufficient for any weight.

Railroad to Cairo.

Mr. Douglas succeeded, on the 2nd instant, in getting his bill for an appropriation of lands for the construction of a railroad from Chicago to Cairo, Ill., through the Senate. This bill contains a grant of every alternate section of land comprised in a strip five miles wide on each side of the road. The bill was so amended, on its final passage, as to make a similar donation to a continuous road from Chicago to Mobile. This railroad will embrace the most important points of communication on the Mississippi River. The time will yet arrive when communication by water conveyance, will be of but small importance compared to what it now is in the interior of our country. The railroad will yet banish both the canal and river boat from competition, except in carrying heavy freight.

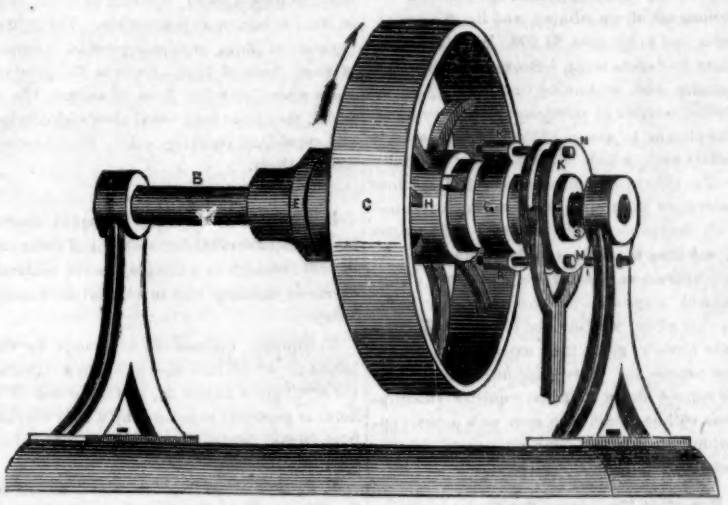
Foreign Hops in England.

The importations of foreign hops continue to take place to a considerable extent from the United States of America, and also to lesser extent from Belgium, the produce of these countries, which is of importance, as evincing the practicability of a continuance in the supply of this novel article of foreign merchandise throughout the year, the present being the first of such importations from abroad taking place. The American ship Independence, from New York, brought 101 bales, consigned to order; the Nautilus, from Antwerp, 5 bales; Soho, from Antwerp, 10 bales; and the Sir Edward Banks, from the same place, 15 bales of the article.

A coach of colossal dimensions is at present being constructed in Edinburgh. It will afford ample accommodation to forty-eight passengers, be drawn by five horses, and run almost hourly from Edinburgh to a neighboring town much frequented during summer months.

Engines are now constructed for sale in London, called Phillip's fire annihilators. They are drawn on wheels very easily by two men. The largest machines cost $35. They emit a humid, expansive vapor, which instantly extinguishes fire.

IMPROVED CLUTCH FOR MACHINERY.

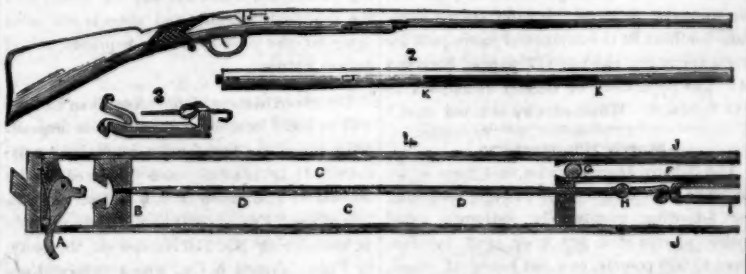


This improved Clutch is the invention of Mr. Nelson Barlow, of St. Louis, Mo. The principal feature of the improvement consists in securing a screw on the clutch shaft, which graduates the coupling of the machinery, so as to prevent jarring or sudden shocks, in clutching. It is well known that in connecting machinery by the common clutch, there is always a sudden jar or shock experienced, and if the running machinery has a high velocity, it is liable to break the clutch, unless it is made very strong. This evil is effectually removed by this improvement. This engraving is a perspective view, and is designed to represent those parts particularly, to which the improvement is applied. B is the running shaft; E is a fixed collar on it, and C is a large pulley, which is converted into the fast or loose pulley by the clutch, as may be desired. Twe pulleys may be operated by this clutch for reversing machinery, but this plan is not represented in the engraving. The pulley is represented as running loose in the direction of the arrow. H is the collar of the pulley, with two projections on its face (only one seen.)—G G is a long nut through which the screw part, L, of the shaft passes; K is the clutch or sliding collar on the nut; it has a groove of the usual kind in it, with a fork lever to slide it forward and back on the nut. R R are two lugs through which the clutch pins pass to take into the projections of the collar, H. N N are the outer ends of the said pins, which, when the clutch is out of gear, should be retained by the pin, I, on the standard to prevent the collar, K, from turning round.

When it is desired to make the loose pulley fast, the clutch collar, K, is pushed by the fork lever towards the face of the pulley, when the pins take into the projections, and the said collar moves round, screwing the nut, G, and the shaft together, thus making a very close coupling. When it is desired to ungear, the collar, K, is drawn back on the nut, G, until it is arrested by the pin, I, taking into pins, N N, when the nut, G, is held, and the pulley, by passing around, unscrews itself, as will be understood by every mechanic. One advantage about this improvement is, that the harder the drag there is upon the pulley, the firmer is the coupling geared together. A very small turn of the screw sufficeth for gearing and ungearing. Another modification of this improvement consists in discarding the pins and projections, and substituting a cone cup on the collar, H, and a cone face on the sliding collar, with a feather in the nut, G, to gear and ungear in the same way. We believe that this is a good invention, and of no small importance to those engaged in the construction of machinery.

The inventor has taken measures to secure a patent, and more information may be obtained from him by letter (*p. p.*) addressed according to the above direction.

NEW AND SIMPLE AIR GUN.---Fig. 1.



This gun is the recent invention of an English mechanic named Mr. John Shaw, of Glossop, and is of great simplicity, and can be constructed by any of our gunsmiths. We do not say that it will propel a ball with the effective force of gunpowder, but it will enable a sportman to amuse himself at but little expense, and will do execution, too, at considerable distance from the mark. The air that projects the bullet is condensed by a piston, which draws out a strong india rubber spring, which, when it is set free, suddenly draws up the piston, condensing the air in the air chamber, and impelling it against the bullet to discharge it with considerable velocity and power.

Fig. 1 is a view of the gun. Fig. 2 is a detached view of the barrel. Fig. 3 is a view of the hook to draw down the piston, and fig. 4 is a large vertical longitudinal section of the stock, showing its interior. The same letters refer to like parts. A is the trigger; B is the movable piston, which condenses the air. It is formed with notches to take into the trigger when drawn down, and to be set free when the trigger is pulled; D D is a strong steel wire with a bead, H, on its outside of the breach plate, which has an opening through it, in which the wire works air tight. J J are the two sides of the chamber and case; G is the ball; F is the barrel, and I is the strong india rubber spring attached by a link to the hook on the end of the wire, D. The spring is capable of being drawn out the full length, from the bead, H, till the piston notch catches into the trigger. Fig. 4 represents the piston just liberated and the ball starting.

After the ball is placed in the barrel, the hook, fig. 3, is introduced into the groove, K K, fig. 2, catching round the bead, H, and then by pulling on the hook with both hands, the piston, B, is drawn down till it catches into the trigger, A: it is then ready for discharging. The butt of the gun should be placed against the thigh, to pull down with the hook. The hook, therefore, loads (it may be said) the gun. The india rubber spring has to be very strong and elastic, made of the best quality of material, as the power of discharge depends upon the suddenness with which the india rubber contracts to its fixed natural dimensions.

Useful Receipts.

Phosphurets.

Phosphurets are compounds of phosphorous with metallic and other bases; phosphuret of sulphur is employed to form matches, for the production of instantaneous light, phosphuret of lime has the remarkable property of decomcomposing water, when a piece of it is thrown into water the hydrogen that is liberated unites to a portion of the phophorous, and forms phosphuretted hydrogen—which takes fire on coming in contact with atmospheric air.

Phosphuretted Hydrogen.

Phosphuretted Hydrogen, is a gaseous compound of phosphorous hydrogen, it is extremely combustible, inflames by mere contact with the atmosphere, in oxygen gas inflames with a brilliant white light,—with chlorine it detonates with a brilliant green, it has a disagreeable smell resembling putrid fish, and combines in but a very slight degree with water. It has been supposed that those lights observed about a church-yard, and where animal matters are putrifying, are produced by the formation and inflamation of this gas, these lights are vulgarly called, "Jack o'the Lantern," "Will o' the Wisp," "Ignis-fatui," &c.

To Form a Phosphoric Fire Bottle.

Put about the size of a pea of phosphorous into a small phial about the size of one used for hair oil, let it be dry—heat a wire and with the hot end of it melt the phosphorous and spread it over the inside of the phial, and cork it—the fire bottle is now formed,—all that is required to get a light is merely to take a sulphur match, turn it two or three times round in the bottle, rub it on a cork and it will inflame.

A Fountain of Fire.

Take two pars of granulated zinc, one part of phosphorous, (say ten grains phosphorous and twenty of zinc), and pour on it, half an ounce of sulphuric acid, (oil of vitriol) in a short time phosphuretted hydrogen gas will be produced, extinguish the lights, and beautiful jets of blue flame will be seen to dart from the bottom of the liquid, while its surface will be covered with a luminous smoke. This is a beautiful experiment and is easly performed.

Great Steam Ship.

A French battle steam ship of 100 guns, named the President has her machinery just finished. Each engine is 960 horse power. It is the largest steamship in the world, but time alone will tell whether it will be successful or not.

Miscellaneous.

Correspondence of the Scientific American.

WASHINGTON CITY, May 14, 1850.

The fire-proof tiller rope invented by Dr. Johnson, of New Orleans, is highly spoken of here, where it has been tested. As the law of Congress, relative to iron chain and wire tiller rope, has long been a dead letter, this invention will prove of great value. I understand the Navy Department are about to contract for a large supply.

During the last week about half a dozen memorials have been presented from patentees, asking a continuance of their patents beyond the terms allowed by law. There is, however, on the part of the Patent Committees, a strong feeling against such application, inasmuch as they are averse, unless in extreme cases, to intermeddle with the affairs of the Patent Office.

Professor Rogers is drawing crowded audiences to hear his lectures on Geology at the Smithsonian Institution. He advances many new theories, and supports them with strong arguments. At his last lecture he contended that the body of the sun is a mass of fluid lava, and the spots are caused by the condensation of portions of the fluid mass. His theory of earthquakes is, that they are caused by the waves of lava which constitute the interior of our globe, and that the undulating chains of mountains are the result of the upheaving and forward motion of these waves.

The Printing Committees of Congress are endeavoring to expedite the printing of the whole of the Patent Office Report, but with very little chance of success. The fact is, the amount of printing ordered at the present Session will, when completed, exceed half a million of dollars, and the work being confined to a few persons, renders its progress ruinously slow.

The House having agreed to the Senate's amendment to the Deficiency Bill, the eastern wing of the Patent Office building only will be finished at present. The second story is already far advanced.

The Third Annual Exhibition of the Maryland Institute is announced to take place at Baltimore in October. Mechanics and manufacturers throughout the United States, are invited to exhibit specimens of their handiwork, and to become competitors for the prizes.

There are numerous enquiries after Mr. Porter from the subscribers to his balloon stock. They think that unless he hurries himself, all the gold in California will be gone before he can convey them there.

A new scientific monthly publication commenced here about three months ago, has given up the ghost.

About twenty acres of the ground of the Smithsonian Institution have been manured and sown with oatr, which have grown about a foot high, so that a beautiful contrast is afforded to the former desert of red sand. Over a thousand young trees have also been planted.

A scientific gentleman, speaking yesterday of the human eye, described it as the sentinel which guards the pass between the worlds of matter and of spirit.

From present indications the nomination of Mr. Ewbank will not be acted upon until it shall have been ascertained how a certain friend of his in the Senate will vote on the Compromise Bill.

By an old Post Office document, I see that the first stage between New York and Boston commenced on the 24th day of June, 1772, to run once a fortnight, as a "new, useful and expensive undertaking." The trip occupied thirteen days. The first stage between New York and Philadelphia commenced running in 1756, and occupied three days. In 1785 an act passed the Legislature of New York, granting to Isaac Van Wyck, and others, an exclusive right of keeping stage wagons on the east side of the Hudson, between New York city and Albany. What a revolution has been wrought in a few years, originating with the man described in your last number as sitting in his obscure room at Paris, with the rough figure of a steamboat marked on the wall. Verily, Fulton carried within him a spark which has lighted the world! *

Unrolling a Mummy.

The "Traveller" says that Mr. Gliddon, the Egyptain traveller, who is now lecturing in Boston and exhibiting his Panorama of the Nile and various curiosities illustrative of the past history and present condition of Egypt, offers to open one of the mummies in his collection, if a suitable subscription can be raised. This mummy is the body of the daughter of a high priest of Thebes who lived more than 3,000 years ago, or about the time of Moses. It is one of the most valued specimens of the curious art of embalming, and its market value is said to be about $1,500. Mr. Gliddon proposes to devote three lectures to the work of opening and explaining this mummy, if the needful number of subscribers can be obtained. The plan is, to secure 300 subscribers, at five dollars each, which will entitle the subscriber to four tickets of admission to each of the three successive lectures to be given in connection with the opening of the mummy. The process of enfolling the body is to be conducted under the supervision of several of our most distinguished surgeons and physicians. A larger number of our wealthy and influential citizens have already given their names to encourage this curious and interesting undertaking, and we cannot doubt that the requisite subscriptions will be obtained so soon as a general opportunity is offered to our citizens to express their interest in this enterprise.

Practical Engineers for Steamboats.

"On the 30th of March the Philadelphia encountered a severe gale, about fifty miles from Jamaica, which lasted until the 6th of April, on which day the rock shaft, on the ambrosial engine, broke. Disconnecting the engine, the engineers worked the larboard engine until the next morning, when its rock shaft also broke. The engineers were then compelled to work the engine by hand, until they reached Chagres, a distance of some seven hundred miles, the thermometer standing, during the time, in the engine room, at 120 degrees. Reaching Chagres they obtained an old anchor, which, by the means of a furnace built upon the beach, without a forge, they managed to manufacture a rude shaft; a bar of iron used to fasten the life boat they converted into another. A spare crank furnished the means of making the toes. Being without lathes, on their return to the steamer, they chipped and filed the shafts to suit their purpose, and then sailed an hour and a half after the Crescent City, arriving here three hours before her. The work, of course, from the want of proper tools, was rudely done, but it answered the purpose admirably.

Taxes in Great Britain.

WINDOWS.—The amount of window duty paid in Great Britain, last year, was $9,066,145.

NEWSPAPERS.—For England the stamp taxes on newspapers, for 1849, was $1,485,710; for advertisements, $640,265,000; Scotland, or stamps, $152,720,000; advertisements, $60,000. Ireland, stamps $132,780; for advertisements, $55,000. Ireland stands lower than Scotland in the amount of taxes paid for newspapers, yet she has 117 papers, Scotland 94. The population of Ireland is about 3 to 1 in Scotland. Which country is taxed most?

Stavch Manufactory.

The Albany Journal states that there is an immense Starch Factory at Oswego, producing the following results:—It consumes 2,000 bushels of ripe corn per week, and manufactures 40,000 pounds, or 1,000 boxes of starch during the same time. There are 11 furnaces, with corresponding drying rooms, and 200 cisterns for receiving the starch in the fluid form. The number of men occupied is about 70, and the value of the starch annually employed exceeds $124,000.

The steamships Cherokee and Georgia sailed for Chagres last Tuesday, loaded with California Emigrants.

A new Bay, named La Trinidad, has been discovered in California. It has a good northern entrance and a good harbor.

Animal Life in Water.

A single drop of water, one-twelfth of an inch in diameter, has been known to contain billions of sleepless, animated beings, between whose moving forms there exists not a millionth of an inch. Science has given these the general name of infusoria. These animals are found to be highly organized, and to possess a tenacity of life almost bordering on the marvellous. There are two grand classes of these animals, called the polygastria and the rotifera. These are sub-divided into thirty-eight families, which are still further divided into more than seven hundred species. Many of these are found to have a flinty covering of silex, that in itself is almost indestructible. The polishing slate of Bilin, or tripoli powder, is formed of these shells of flint. Even in the polar regions where no other form of animal life is found, they have been found alive sealed in ice, and capable of resisting cold. Heat does not destroy them.

Horse Power.

It is well known among engineers that a horse is capable of raising a weight of about 150 lb. 220 feet high in a minute, and to continue exertions enabling him to do that for 8 hours a-day.

Multiplying the number of pounds by the height to which they are raised in a minute, 150×220 gives 33,000 lb., and the power of a horse is generally expressed by a sum varying from 30,000 lb. to 36,000 lb., raised 1 foot high in a minute.

N. B. Bolton and Watt express it by 32,000 lb.; Woolf, by 36,000 lb; Tredgold, Palmer, and others, by 33, 333 lb. One horse can draw horizontally as much as seven men.

FRICTION.—In trains of machinery from ¼ to ⅓ is allowed for friction.

Steamship Pacific, the Second of Collin's Line.

The magnificent steamship Pacific, the second of Mr. Collin's Liverpool line of packets, is receiving her engines and boilers at the head of Water street, from the foundry of Mr. Allaire, had steam got upon her yesterday, and she breathed the breath of life for the first time. Her ponderous machinery moved with the greatest precision and ease, and gave perfect satisfaction. She will make a trial trip some day this week, and will take her place at the foot of Canal street, on Monday next, the 20th inst. A large number of passengers have already secured state rooms in her for her first trip.

Morals in Scotland.

There are sixty-four prisons in Scotland, but one fourth of them are entirely empty, and another fourth contain only from one to half a dozen prisoners. It is now proposed, such is the decreasing demand for prison room, to reduce the number of jails to six. Such is the influence of an all-pervading orthodoxy upon the public morals.

The N. O. Delta believes that cholera, instead of orginating in the towns on the Western waters, is caused by the crowded condition of the steamboats, some of which are floating black holes, where the very air reeks with the deadliest miasma, and there is not even space for the most ordinary requirements of human nature.

The advertisement of the "American Union" will be found in another column, it is unqualifiedly one of the best family journals in existence. It is carefully and ably edited by Messrs. G. P. Burnam & R. B. Fitts. An edition of the "Union" will be regularly published hereafter at No. 116 Nassau st., this city, by Fitts, Johnson & Co., where subscriptions will be received at $2 per annum.

There is a church in Ohio where the water that runs off the roof on one side goes into the Gulf of Mexico, and that which runs off the other side goes into the Gulf of St. Lawrence.

Next week we shall publish an engraving of Wilson's Patent Stone Cutting Machine, on a large scale.

It is reported that an expedition has sailed for Cuba, to revolutionize it. The booty is to be segars.

California.

The news by the steamers of the first inst., from California, is not at all favorable. The amount of gold dust falls short of the estimates indulged in by our most careful observers, who are largely interested in shipments of merchandise of all kinds, and the price current in San Francisco shows a rapid decline, which bear evidence that a revulsion has already commenced. It is thought that many shippers will not only sink the cost of shipments in this market, but will have to pay heavy charges for freight. Failures have commenced, and a general explosion among the operators of San Francisco must be the result. The enormous value of money—the great demand—the extravagant prices charged for property of all kinds, tends to strengthen the opinion that one of the greatest revulsions ever experienced in any part of the world, will take place. It is entirely out of the nature of things, that such an intense excitement as that which has so far attended all the movements towards California, could continue for a great length of time without resulting in overwhelming reverses,—that crisis has, to all appearances arrived, and many will reap sorrow where prosperity was apparent.

In all the accounts given by the correspondence from San Francisco, although the writers have an interest in presenting a clean account of the state of affairs there, we see no encouragement held out to justify new operations. The result of all this will be that a firmer and more stable business will be established upon the ruins of this crash; but this cannot be expected at present.

By a letter under date of March 22nd, from an intimate friend now transacting business in San Francisco, we extract the following which fully justifies all that we have said upon the subject:—

"The San Francisco of last Fall has departed—that bustling, busy bee hive has ceased working, and the present San Francisco, although crowded with people, is doing but a small portion of the business of last Fall.—Property is every day given away at the auction stores: umbrellas have been sold at $1,25 per dozen; a large lot of hardware, costing over $1000 at home, was sold the other day for $7,50; ships are crowding into port with lumber, which the consignees refuse to pay freight upon in consequence of low prices, and cargoes are sold every day to pay freight. Lumber sold for $20 per thousand, which cost $18 at home, and about $80 to bring out here.—Such are the results of thousands of orders—there is nothing upon which profit can be reasonably insured for 90 days.

Even potatoes, which at one time would command readily $1 to $3 per lb., have been rushed into market so fast that they do not pay the expenses of bringing them from the Islands. These circumstances combine to give a sombre tone to business matters."

This plain statement of facts is fully corroborated by other advices, and our opinion is that those who are comfortable here should remain satisfied, and all who are uncomfortable have surely no encouragement to emigrate to California.

The Newark Daily Advertiser, a very ably conducted journal thus speaks of the Scientific American:—"It is always a welcome visitor, bringing a variety of substantial information with regard to the progress of mechanical improvements, condensed into a more accessible form, than can be found elsewhere. It is the best paper devoted to the mechanical interests, we know of."

The Western Journal, a monthly publication of great ability, published by Traver & Risk, of St. Louis, at $3 per annum, says, in speaking of the Sci. Am., that "this valuable publication comes fully up to all that its title imports; and should be read by every individual who desires to be informed in respect to the improvements of the age."

Summer shawls in Paris are now worn of black silk, with embroidered borders of the cashmere patterns. The borders are twelve inches deep, the embroidering is in bright tints, yellow predominating, giving the effect of gold.

How to Cross the Atlantic in less than Five Days.

[Continued from page 83.]

We will give one or two more illustrations of our theory, and then describe the vessels resulting therefrom.

Make a groove on the side of a board ten or twelve feet long: place that board on a table, then make several model vessels; one of them in accordance with our theory, and with their keels so made that they will run easily and securely in the groove; suspend over each side of the groove a row of say ounce balls from the top of the room, (the higher the room the better,) and in moving the vessels along they will part the balls to the right and left. As the balls are suspended freely, almost their whole resistance to the motion of the vessels will be from the power of inertia; and as we increase the speed of the vessels the balls will be thrown further and further to the right and left; as it requires force to throw the balls, of course that vessel is shaped best that throws them to the least distance. Water will part freely to the right and left; so will the suspended balls. The resistance offered by both is caused by the power of inertia; but the balls show by the distance they are thrown how much inertia is overcome by the different forms of the vessels. In order to be certain that the vessels move at the same rate, two grooves and sets of balls may be provided, and two vessels moved at the same time by lines running over the same wheel.

Another proof of the theory may be obtained in the following manner:—instead of the two rows of balls, suspend one ball so that the vessel will pass under it; or rather, for convenience, suspend a block of wood about four inches square, having a hole downwards through it to admit a pencil; then place a long light board on one of the vessels covered with paper, so that the pencil in the suspended block will mark a line as the vessel passes under.

Next fasten a small cord to the suspended block, and carry it horizontally to the right or left; thence over a pulley and down to another similar block that rests on a support that is easily overthrown. If we now so arrange it that a projection from the vessel will overthrow the support of the last mentioned block, just at the moment the pencil reaches the bow, then the second block will draw the first to one side by a steady and equal force, and the pencil will mark on the paper the curve of least resistance, or the true form for the bow of a vessel. It would in fact describe exactly such a curve as our rule gives. To make the pencil keep clear of the side lines of any differently formed vessel, would require a greater force, and of course an irregular one; and in all irregular forces there is a waste of power. When a vessel sails through water it pushes a body to one side that is floating freely, with nothing to hinder it moving but inertia, and in the experimental case with the pencil, we pull by an even force to one side a body that is freely suspended, nearly the whole of its resistance being also from inertia.

It is evident from our theory that we must not only form the sides of our vessels with that waving curve, the rule of which was given on page 83 of the present volume, but also that we must contract the breadth and increase the depth and length as much as is consistent with the purposes for which a vessel is employed, and the nature of the element through which it passes. Reference should also be had somewhat to the manner in which it is propelled; because where the point of traction is above the water and the centre of resistance below the surface, there is a tendency to plunge the bow under and raise the stern, which must be counteracted by a large excess of length as compared with the depth. The true proportion between the length, breadth and depth being a compromise, in which inertia should be favored as much as possible.

We give our estimate of such a compromise in the following table:—

	No. 1.	No. 2.	No. 3
Length,	160	320	960
Depth,	5	10	30
Greatest breadth,	2½	5	15

Here follows a table, but as it is somewhat long, we leave it out: it makes the central breadth of No. 1, 30 inches; No. 2, 60 inches, and No. 3, 180 inches.]

No. 1 could easily carry power sufficient to move her sixteen miles an hour; but in the present state of science could not carry fuel enough to cross the Atlantic.

No. 2 would require four-fold the force to propel it that No. 1 required, but being of eight times the tonnage, it could therefore carry two-fold the proportionate power, which would move it about twenty miles an hour.

No. 2 could carry coal enough to cross the Atlantic, and might have her upper works made as wide as a canal packet, so as to lodge with comfort fifty passengers.

No. 3 would require nine times the force to move it that No. 2 required, but being twenty seven times larger it could therefore carry three times the proportionate power, and could easily cross the Atlantic at the rate of 28 miles an hour. I forget the estimated distance from Halifax to Liverpool, but suppose it is not far from 2,500 miles. If that be the distance, then No. 1 could traverse it in seven days; and No. 2 in five days and five hours, and No. 3 in about three days and seventeen hours.

[The last of these articles will be concluded next week. We have had an answer on hand for them for some time, and it will follow the next article. It was fortunately delayed until this article arrived.—Ed.

The Silks and Teas of Japan.

The silk of Japan has long been celebrated throughout the world, though often produced under circumstances the most discouraging.—The little now exported finds its way chiefly to Java, where it is worn by the native chiefs and the wealthy Dutch officials. Occasionally some few pieces are brought to Holland, where they are regarded rather as curiosities than as merchandise. Supposing the trade opened, the silk dressing gowns of Japan would, no doubt, become a considerable article of export. They may be regarded as the most extraordinary article of dress in the world, being from an inch to an inch and a half thick, which suggests the idea of immense weight, though in reality they fell, when worn, as light as gossamer. The thickness is produced by wadding, composed of some substance so fine and delicate that, like the "woven wind" of the ancients, its separate fibres are almost invisible.

We must not, in this slight sketch of Japanese exports omit the tea, the costlier kinds of which are, on all hands, admitted to be more richly flavored than those of China.—Very few specimens have for the last two hundred years appeared in the English market, and these, at the India house sales have brought from fifty to sixty shillings a pound. In all likelihood, however, these were not by any means the finest specimens, since what are called on the island Imperial teas are consumed almost exclusively by the princes and nobles. Strange stories are related of the means of producing this courtly beverage, and there is probably in all of them no small admixture of the fabulous. Still, as they are characteristic of Japanese manners and ideas, our readers may not dislike to be presented with a sample of it.

The tea shrubs intended for the use of the Imperial court are grown on a mountain near Meaco, that is, in the district supposed to be the most favorable in the world to the production of this article. This mountain is fenced round from vulgar intrusion by a ditch and thick hedge; and none but those employed in the cultivation of the tea are permited to enter. The shrubs are laid out so as to form avenues, which are daily swept and kept scrupulously clean.

So far the precautions taken are intelligible, but in much of what follows the reader will detect the influence of an oriental and imperial imagination. The young leaves which begin to put forth about the first of March which commences the Japanese year, are gathered when only a few days old—that is, in their most tender and delicate state. The persons employed in collecting them are subjected, under the most rigid discipline. During the operation they must not eat fish, or any other article of food likely to affect their breath. They are next compelled to bathe twice or thrice a day and, after all, are not permitted to touch the leaves with their hands. They therefore work in gloves; and the delicate green treasure, when collected, is deposited in corners of white paper, till subjected to the drying process analagous to that employed in China.—Into an account of this, it would be beside our present purpose to enter; bnt we may mention that there are three gatherings of the tea leaf—the first, which takes place as we have said early in March; the second at the end of the same month or the begining of April; and the third in the begining of May, when the leaves are two months old. This last gathering produces the coarsest kind of tea, appropriated to the use of the humbler classes.

The cultivation of this delicate shrub is conducted among the Japanese upon principles somewhat different from those that regulate its growth in China. It is not commonly laid out in distinct plantations, but in lines, which serve as hedges between the corn and rice fields. The seeds are thinly sown in drills, four or five inches deep, and when the shrub has attained its full growth, that is in six or seven years, and is about the height of a man it is cut down and succeeded by fresh shoots.

For various reasons, the trees are not planted close—first, because they would then cast too dense a shade; secondly, there would not be around them a free circulation of air, which would impart a rankness to the leaves. In many cases the cultivation is carried on upon the most arid mountains, which probably stunts the shrub, but improves the flavor of the tea. In most cases, the excellence of vegetable productions is proportioned to the aridity of the soil, which occasions a diminution in quantity, whilst it improves the quality.—Thus the olives of Attica were the most prized in antiquity, as the honey was the sweetest and most fragrant. For the same reason, it can scarcely be doubted that the superior teas of Japan are unrivalled for aroma and delicacy of flavor. It is no way inconsistent with such an opinion that the wealthier Japanese set a high value on the finer teas from China, because, all the world over, mankind are fond of variety, and especially commodities brought from a distance.

Coal in California.

Los Angles has been previously celebrated for its "Coal Springs," as they are called.—They are thus described by a gentleman who lately visited there:

"Along the base of a hill, or range of hills, some miles in extent, at intervals of a few hundred yards, were issues of bituminous tar o Naptha, which had accumulated in immense quantities on the surface, and changed by exposure to a dark colored solid, called by mineralogists Petroleum. We collected several fragments of it and placed them upon a fire kindled near the spot. They readily ignited and burned with a clear flame, melting slightly as they consumed, and generating a strong heat. This experiment we repeated several times with the same result.

In burning, the smoke and flame were similar to that of bituminous coal. Vast quantities of the Petroleum lay on the ground in solid masses. The strata above and below the issues are sand stone and coarse clay slate.—From the fact that bituminous matter is constantly emitted from the springs. I have little doubt that the hill contains an immense quantity of bituminous coal from which the liquid bitumen proceeds. A subsequent examination strengthened the conviction.—The next day Mr. Swan, who has commenced mining there, proceeded to sink a shaft on a depression of the hill a few rods above one of the springs. At the depth of a few feet masses of solid matters were thrown out, similar in appearance to bituminous coal. Upon trial, it burned freely without melting.

The hill lies within thirty miles of the port of San Pedro, by a level road, and it could be readily transported thither in quantity sufficient to supply the demand of steam navigation.

Ohio Wine.

The Horticultural Society of Cincinnati are about to issue certificates or premiums upon samples of superior wine produced in that State.

Destruction of the Great Cathedral of Saragossa.

By recent accounts from Spain it appears that on the 7th of April, according to the custom of the townspeople, the whole poupulation, gaily attired, had assembled in the cathedral to follow the procession of the Holy Sacrament. The crowd was immense, and the procession was preceded by a band of music and a guard of honor. Scarcely had the procession issued from the massive portals of the cathedral, ere the heavens became clothed with darkness, a huge black cloud hung like a pall over the town, and suddenly the floodgates of the skies were opened, and the rain descended in such torrents that the whole procession was forced to take shelter within the cathedral.—The people told their beads, and were overwhelmed with terror at the Cimmerian darkness which enveloped the sacred edifice. Presently there was heard a terrific crash, accompanied by a noise loud as the roaring of artillery. It was found the lightning had struck the spires of the catheral, and entering through one of the numerous interstices of the light and graceful archetecture, struck dead the bell-ringer, and penetrated to the timber roofing, which immediately blazed forth with a fury admitting of no control, although the heavens continued to pour down their waters upon the burning rafters. The crowd preferring even water to fire, rushed forth into the streets, through which the water was pouring in torrents, and left the unquenched flames to do their fiery work. The roof fell in towards the afternoon, and then the priests incited the people to attempt the preservation of the interior, and the course of the flames was at length arrested. Thus has perished the noblest specimen of ecclesiastical architecture in all Arragon, perhaps in all Spain.

A Human Body and the Hour of Day.

Seat yourself at a table. Attach a piece of metal (say a shilling) to a thread. Having placed your elbow on a table, hold the thread between the points of the thumb and fore finger and allow the shilling to hang in the centre of a glass thumbler, the pulse will immediately cause the shilling to vibrate like a pendulum, and the vibrations will increase until the shilling strikes the side of the glass; and suppose the time of the experiment be the hour of seven, or half past seven, the pendulum will strike the glass seven times, and then lose its momentum and return to the centre; if you hold the thread a sufficient length of time the effect will be repeated; but not until a sufficient space of time has elapsed to convince you the experiment is complete. We need not add that the thread must be held with a steady hand; otherwise the vibrating motion would be counteracted. At whatever hour of the day or night the experiment is made, coincidence will be the same.

[The above extract we have seen in a hundred different papers, we suppose. At the first glance, we thought it savored so much of the old hocus pocus nonsense, that it would be worth an experiment, for the sake of its antiquity. The result was, complete proof its authenticity, (not truth, mind.)

A New Propeller Steamship.

Mr. Wm. Cramp and Joseph Vogel, Esq., are now engaged in laying down the moulds of a new propeller steamship about to be built for the Philadelbhia and Atlantic Steam Navigation Company. She will be about 600 tons burthen, and her dimensions 170 feet long, 28 feet beam and 19½ feet hold. The contract for the construction of the hull has been given to Mr. Cramp, who will lay the keel as soon as the steamboats now on the stocks at his yard in Kensington are launched. Mr. Vogel is to superintend the construction of the hull; the model for which has been supplied by Ambrese H. Thompson, Esq., the President of the Company.

Library of the British Museum.

The Athenæum, in referring to the recently-issued and bulky parliamentary volume, says the library of the British Museum contains 450,000 volumes, and that it has been calculated by an officer of the institution that, if they were all required to be placed on one shelf, that shelf would be at least twelve miles in length.

New Inventions.

Drilled Eyed Needles.

We learn by the "Sentinel of Freedom," Newark, N. J., that needles of the above named kind are made in this country, and by the original inventor, Mr. Wm. Essex, an Englishman. His factory is in a secluded nook of New Jersey, near Newark. The wire used is made in England expressly for the purpose—the manufacturers of this country not having yet accomplished the manufacturing of wire suited to this purpose. It is first cut into suitable lengths, according to the size of the needles to be made, when they are straightened and pointed upon a stone which is required to be turned with great velocity; they are then stamped, or an impression made upon them where the eye is to be made; after which the eye is punched by means of a press invented for the purpose. The burr made by stamping the eye is filed smooth, after which the hardening and tempering is performed, and then they are again straightened so as to make their shape perfect. By means of machinery, they are scoured and brightened, and the closing processes are, the assorting them by placing the heads and points their respective ways; the eyes blued, or the temper at that point taken out, that they may not cut, and the drilling, counter sinking and burnishing the eyes.

This peculiar branch of manufacturing, although not entirely new, is nevertheless of somewhat recent origin in this country.

Ingenious Machine for the Use of the Blind.

For some years past Mr. Hughes, governor of Henshaw's Asylum for the Blind, Old Trafford, England, has been trying to find out the best mode of enabling blind persons to correspond with their relatives and friends; and when in Paris, lately, that gentleman saw, in an exhibition of arts, three machines designed for the object which he had long and anxiously been seeking to attain. One was by M. Foucourt, and that seemed to him to be the best adapted for the purpose. Under this impression he purchased one, with a book of directions, and brought it with him to England.—On trial, however, he found the machine almost utterly useless to the inmates of the Asylum, inasmuch as it was requisite, in order to use it, that 1040 single operations should be performed to make the alphabet and some figures. By the machine in question no fewer than 153 operations were required to form the letter W alone. Mr. Hughes then set to work himself, and the result is that he has succeeded in producing a machine remarkable at once for its ingenuity, simplicity, and utility. The machine consists principally of a circular disc of brass. Close to the edge of the disc is an embossed alphabet, with the usual figures and points used in punctuation. Inside this circle is a disc of common letter-press types, corresponding in number with the raised letters of the outer circle. The disc is moved longitudinally by means of a screw, and any letter that may be wanted is brought under a lever placed at right angles with the screw, which keeps the writing in a straight line. The types act upon carbonized paper, under which is placed a sheet of white paper, placed on a piece of pasteboard, and thus the desired impression is conveyed. The whole of the machine is not greater in size than a foot square, and Mr. Hughes has plans in operation for still further simplifying it, with the view of rendering it still more useful. The inmates of the institution at Old Trafford have already used his ingenious machine with the most happy and successful results.

[The above is from the Manchester Courier, and if we mistake not, there is a similar machine used at the Philadelphia Blind Asylum, which was invented by the superintendant.

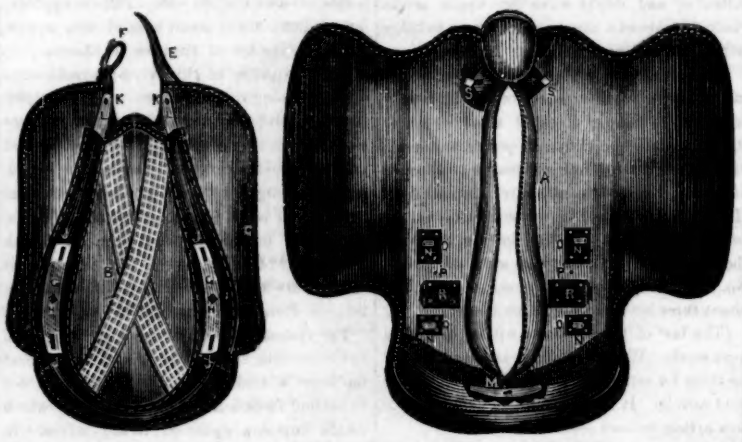
Great Improvement in Daguerreotype.

Mr. Chas. J. Anthony, of Pittsburg has invented one of the grandest improvements ever made in the art of Daguerreotyping; in fact we believe it second only to the discovery of Daguerre himself. The improvement consists in what is termed the "Magic Back Ground," which is given by a chemical process, and consists in overcoming one of the greatest difficulties that artists have to contend against. Mr. Anthony, by his process, can give the picture any kind of back ground he pleases—light or dark and imitation of sky, or draperied canopy. One sample which we saw, had a back ground in imitation of *pearl*, with the picture standing out in full relief. The back ground can be given either before, during, or after the impression is taken. The process is simple and the expense trifling.

Mr. Anthony has applied for a patent, and has assigned his interest of it to Mr. Levi Chapman, of this city, who will no doubt make a grand affair of such a deserving and meritorious discovery.

IMPROVEMENT IN SADDLES.

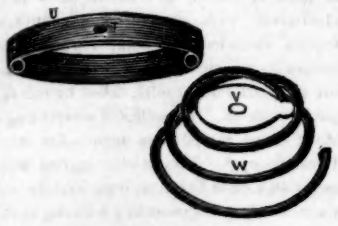
Figure 2. Figure 1.



This improvement on saddles we briefly noticed on page 260. It is the invention of Mr. Geo. Fisher, of Raleigh, N. C., who has taken the usual measures to secure a patent for the same. The nature of this improvement is to have a moveable seat to be attached to the pad of the saddle, with springs underneath the same, to give a gentle and easy motion to the rider.

Figure 1 is a top view of the pad of the saddle or tree, and figure 2 is a view of the underside of the moveable seat with curved or arch springs on it. A represents the pad of the saddle, which has an open space in the middle, and which most effectually will prevent the back of the animal from being galled, as the seat sits above the pad with a space between, and thus the saddle is made refrigerative,—something very much wanted. Figures 3 and 4 represent different kinds of springs, which may be used as well as the arched ones, G G. W is a coiled spring, and U is an eliptical one. They can be secured in the openings, T V, on the pad; the nuts, H

Fig. 3. Fig. 4.



H, secure the arched springs. B B are cross straps; L L are the wooden parts of the frame of the seat. On the saddle pad fig. 1, R R, are metal plates for the springs of the seat to rest on when the seat is placed on the pad, and N N N N are four heads on metal plates, O O O O, which take into the slots, J J J J, of the seat springs, to retain them and prevent them springing laterally or forward, only allowing them to rise and fall with the motion of the rider. The back part of the seat, fig. 2, fits into a recess indicated by dotted lines in the back part of saddle pad, and E F is a strap and buckle of the seat which pass around the raised crupper, the front of fig. 1, to retain the seat in its place; S S are two screw nuts, which are inserted in the holes, K K, passing into the openings in which they are now represented in the saddle tree, fig. 2, to retain the seat more snugly in its place. M is a back spring, secured on the back of the saddle pad. We have represented the under side of the seat and that part of the saddle tree below it, on which it rests and to which it is secured, so as to show distinctly those parts that are new, and which a careful perusal of the foregoing will enable any person to understand.

The important features on new objects obtained by the improvement, is ease to the rider and the same to the steed. It will be perfectly understood that when the seat is attached to the pad, the springs keep the seat above the pad, hence there is a space between for the springs gently to rise and fall, and the said space, as already mentioned, is a refrigerative arrangement, to prevent the back of the animal from being galled.

More information may be obtained by letters (*p. p.*) addressed to the inventor.

Improved Plow.

Mr. Jas. H. Rodgers, of Mount Morris, Livingston Co., N. Y., has invented a new improvement in the manner of operating the beam of the plow, for enlarging or narrowing the cut of the furrow. A moveable beam to alter line of draught is not new, but the manner of operating the beam for that purpose by Mr. Rodgers, appears to be a good improvement. A cast iron box is fitted to the face of the inner stilt of the plow, and it has a flange above and below, to prevent the inner end of the beam from being directed up or down and to hold it firm. The beam is moved endways by a long screw bolt, which is united to the vertical bolt, which passes down through the beam and body of the mould board, and answer for the axis on which the beam is swung, to change the line of its direction. The manner of keeping the beam snug to the stilt, and yet to change it accurately and easily, is something which commends itself at once to favor.

Measures have been taken to secure a patent.

Patent Inkstand.

Messrs. Fife, of Philadelphia, have introduced an inkstand designed to protect the points of gold pens from the injuries to which they are liable from contact with hard substances. Their improvement consists in the use of a soft, elastic top, so arranged as to secure the points from striking against the porcelain of which the inkstand is made. This promises to be a very useful application of ingenuity.

Wrought Iron Plow Stock.

Mr. James H. Forman, of this country, exhibited during last week, to a few friends in this place, a plow stock, of wrought iron, which for simplicity of construction and efficiency of worth, surpasses any thing of the sort we have ever seen. Its durability, cheapness, and simplicity will, we think, bring it into general use. Any good plantation smith can make one, and to repair it (if by any possibility it should ever get out of order,) would be an easy job for any one.

The model tried by the inventor, Mr. Foreman, weighed about thirty pounds, including a small colter attached to it. All who saw it in use were satisfied that it was the thing—and every one wondered, as they saw it working, that so simple, convenient, entirely manageable and durable a substitute for the clumsy and fragile wooden affair, should not have been sooner discovered. The superiority of the work done by it and the incomparably greater degree of ease to the laborer—as compared with the ordinary plow—were manifest to all.

Mr. Forman, besides being an excellent practical mechanic, is an enlightened reading planter. He tells us he was driven to invent something of the sort, by ascertaining practically the want of economy of the old sort, both as to time and money. He wanted something which would last—not get out of fix—and do first rate work. Besides, he wanted a stock adapted to receive any sort of plow. The one he has invented combines all these advantages.

Mr. Forman intends patenting this invention. We hope he will exhibit it to our friend Peabody and the rest of the agriculturists who will assemble at Columbus, on the second Monday in next month.—[Chambers Tribune.

[So far as it respects some new combination of parts, Mr. Forman's invention may be very useful and patentable, but he could not secure a patent for the mere substitution of iron for wood, according to the common decisions of the Patent Office, except to favored applicants for "brass nails, &c, or fly traps." And we must also state, as it may save Mr. Forman some money, if this meets his eye, that stocks of plows made of wrought iron are quite well known here, and have been in use in what is called the "Scotch Plow," for half a century, at least.

Improvement in Electric Telegraph. Batteries.

In most of the electric telegraph establishments are batteries formed of zinc, copper, and sand, moistened with dilute sulphuric acid,—this sand being strongly pressed between the metallic plates. These batteries, however much an improvement over those formely employed, possess the great disadvantage of diminishing in force, requiring the frequent application of the dilute acid, and a complete removal once in every four or six weeks. M. W. Eisenlohr, the superintendent of the electric telegraphs in the Grand Dutchy of Baden, has for some time past endeavored to find out some method of rendering the battery more constant in its action, and at the same time, less liable to the carelessness of the workmen, who sometimes put too much acid, and at other times leave the battery quite dry,—thus producing a great interruption in the working of the telegraph. After various experiments on the subject, M. Eisenlohr found that the employment of a solution of bitartrate of potash, in acidulated water, for the zinc couples of a Daniell's battery, and of moderately concentrated solution of sulphate of copper, for the copper element, fully and effectually answered the desired object. This battery was found to possess a most remarkable constancy, M. E. Wartman, in speaking of this new battery in the last number of the *Billiotheque Universale*, of Geneva, states that he has made use of a Daniell's battery of ten couples, charged on M. Elsenlohr's system, but placing the zinc couples in acidulated water, and the copper in a solution of bitartrate of potash, and that the battery remained in action for three weeks, without any interruption, exhibited the most perfect constancy.

An American Gas Engine in England.

Mr. Ethan Campbell, of New York, styled a philosophical, practical and experimental engineer, has taken out a patent in England for obtaining an improvement in motive power, by employing the vapor of alcohol as a substitute for steam, and using the same liquid over and over again, alternately generating and condensing the vapor, the apparatus being so constructed and arranged, that no escape of it to the atmosphere is permitted.

Jersey Marble.

The Morristown Jerseyman says that J. H. Gordon, while digging for lime stone at the foot of Turkey mountain, in Pequamac, struck a vein of beautiful white marble, in some portions of which were pyrites of copper, and seams of asbestos of about an inch in thickness. The extent of the vein of marble cannot yet be ascertained, but appearances indicate it to be very large.

Scientific American

NEW YORK, MAY 18, 1850.

Locomotive for Ascending Inclined Planes Controversy.

We have received a pamphlet from Mr. Wm. Hoyt, of Dupont, Indiana, respecting his claims as original inventor of an improved locomotive for ascending inclined planes, in opposition to those of Mr. Andrew Cathcart, foreman of the machine shop at the Railroad Depot of the Madison and Indianapolis Railroad.

The improvement consists in providing a cog wheel on the locomotive to work into a central rack on the incline of the road, the said cog wheel being so adjusted and arranged as to accommodate itself by spring lever power to the unevenness of the track. Mr. Hoyt states that he invented his improvement and constructed a model, in 1840, and that he exhibited it in Philadelphia and Washington, and in that year he filed specifications of his improvements in the Patent Office, thereby, as he says, giving notice to the world of his discovery, but was not able to procure a patent until 1849.

We want to give a word of advice here. The above shows us that Mr. Hoyt had not, and has not, correct ideas about Patent Laws, and we are afraid that this is the case with many of our inventors. The very first thing which should be done, is to apply for a patent, as the laws, when correctly construed, make an invention public property, if it has been in public use two years before applying for a Patent,—this is evidence of abandonment of the invention to the public. Every machine constructed and in use before the application for the patent, can be used after it is issued, for it is not an infringement of the Patent, no patent being in existence before the machine. We are afraid that many are ignorant on this point: Mr. Hoyt we see is, although from the pamphlet before us it appears that he is the original and first inventor, but we have not the evidence of the other side. In April, 1849, he secured a patent under Mr. Burke, and it seems that this decision of Mr. Burke was reversed by Mr. Ewbank on the 1st of last September, awarding the priority of invention to Mr. Cathcart.

An engine upon the principle of the invention in controversy, is now at work successfully on the railroad named, constructed in Philadelphia under the instruction of Mr. Cathcart, in 1847–8. Although it appears plain to us, as we have already stated, (viewing only one side) that Mr. Hoyt is the first inventor, yet he is mistaken when he says, that "if Mr. Cathcart does not establish his title to the invention, the Railroad Co. will have to pay Mr. Hoyt damages." He will find that the 7th section, Patent Laws of 1839, is plain on this point. By this law it may be probable that owing to delay of the inventor in applying for a patent, it is now public property, for this section of the Patent Laws declares that if a machine has been in use two years before application has been made for the patent, the patent, if granted, will not be valid; and it does not appear that Mr. Hoyt applied for a a patent before 1849, which is unfortunate for him. We are always pained to hear of ininventors losing their rights by delay in applying for their patents. If an inventor is afraid that his improvement may be stolen, he should file a caveat, before his model is finished. This can be done by a decent drawing and description, and the *fee* to the Patent Office of $20, forms part of the patent fee. When the model is finished, the patent should be applied for as soon as possible. This prevents after controversies about priority of invention—law suits should alway be avoided, if possible.

Opinions, Rotary Engine, &c.

We frequently receive communications upon subjects which have been fully discussed in our columns before, and consequently we lay them aside, for it would neither be policy nor wisdom to publish them. Those who write will therefore see that we do what we think is right in the matter.

It is singular how many there are who write to us about things which have already been discussed or described by us. A careful attention to treasure up the interesting facts found in our columns, would do more for every one than at first sight they are aware of. We do not pretend to find every one of the same way of thinking as ourselves, for while there are many men, there will be many opinions about the same thing; but as a general thing we are happy to know that our views of things, and our arguments upon almost every question we discuss, find their way favorably into the hearts of reasonable men—men of intelligence and thought.

Last week, however, one of our worthy correspondents differed from us a great deal in our views upon rotary engines. He thought our notions in favor of the reciprocating kind were rather old fashioned, and that we had not right views of the spirit of progress in invention. So far from this being the case, our views upon the subject are strictly in accordance with the spirit of improvement, and although they are a little old fashioned, yet they are not, by thousands of years, as old fashioned as those of our friends who advocate the cause of the rotary engine. The first steam engine was Hero's, which was invented more than two thousand years ago. There is more simplicity in the ordinary rotary engine than in the cylinder one. Any body could make a rotary engine, and one that would operate tolerably well on a small scale, but when we come to a huge engine of great power, all experience—and that is a great deal—has proven rotary engines unfit for prime motors, as compared with the more ingenious and scientific cylinder one. When steam prefers to act in curved lines, instead of straight ones, then a rotary engine will economise the whole power of the steam, but not before, for steam acts by expansive pressure, not by gravitating power, like water.

Every man should examine into the heart of a mechanical principle, and not be content with merely viewing its face, and whenever this is done in the case of the steam engine, there will be far less waste of thought, toil, time and money, upon what are intended to be improvements on the steam engine. We know a case at the present moment where we are sure $50,000 will not clear the expenses of a rotary engine that is now building to propel a steamboat on the North River. The inventor is rich, but we are always sorry to see money and ingenuity thrown away in a wrong direction.

The question about a rotary engine, and many other scientific and mechanical questions about which there are different opinions among a large class of men, cannot be settled by anything less than *deeds*, not words. Ærial navigation, propelling by electricity, &c., are among the number of such questions, but perhaps above all others, at present, a telegraph across the Atlantic absorbs the most attention. Before any company should undertake to construct a telegraph through the ocean, they should first try experiments on a large scale to test its practicability. A proposition like that, should be as clearly established to be practicable before making the final move, as was that of the Britannia Tubular Bridge, by Stephenson. A scheme of such magnitude should not be left to conjecture for success.

The reception of some recent communications, which were more speculative than desirable for our columns, induced us to make the above remarks, which we have no doubt will be of some benefit to not a few of our readers.

Walls of Buildings.

There is a great amount of recklessness, and ignorance also, displayed in the erection of the walls of buildings in this city. It is but two weeks since the walls of two buildings fell down, and in one case eight men lost their lives. It is a fact that many buildings are erected, the outside walls of which could not support themselves for a single moment. There are two evils in their erection. One is the slenderness of the walls, the other is bad mortar. The first is an evil of cupidity, the second may be an evil of the same kind, or it may be one of ignorance on the part of the mason. A strict law requiring walls to be made of a certain thickness, according to their height, will remove the first evil; a knowledge of the nature of mortar and the manner of making it, will remove the second. There are many buildings in this city, the mortar of which can be picked from between the bricks like sand, there being no cohesion between the mortar and the brick. Such buildings are supported by the weight of the mass of materials of which they are composed, and the plumb line of the walls. This is the reason why so many walls in our city come tumbling down when some of the inside supports are taken away, and why others tumble down, after the walls have been thrust out of line by fire.—There are few of our builders who could erect a leaning tower by their present system of building. We see some buildings torn down almost every day, without the least appearance of cohesion between the bricks and mortar. The mortar should be made to form some union, instead of a mere interstrata between the different rows of bricks, &c.

Buildings which are erected in frosty weather are always weaker in their walls than those erected in temperate weather. Why? Because the water of the mortar freezes and destroys the union between the mortar and brick, just as the freezing of water precipitates the heavy particles which before have been suspended in it. Almost every body has observed the truth of what we say. We suppose that some entertain an idea, that all mortar is mortar no matter what kind of lime may be used, how it is treated and how it is mixed, but there is a great difference in the value of lime, and there is just as much in the making of good mortar as there is in making anything else. Anybody can throw some shells of lime among water, and then mix some sand along with it, but such a composition can no more be considered mortar than to mix some flour, water and yeast together, and call it *bread*. As so much of the stability of brick-work and masonry depends upon the binding properties of mortar or cement, especially when exposed to side pressure, such as retaining walls and piers, it is of great importance to ascertain and use the best kind of materials for this purpose.

It was long supposed that the hardness of any mortar depended on the hardness of the limestone of which it was made, but the celebrated Smeaton overturned this idea by his researches on the subject. The most of our limestone, however, can make good mortar, if well treated. After being made into quicklime, it should, for making mortar, be laid in heaps and slacked by pouring water on it, and then it should be covered up with sand when slacked in a heap, until it is wanted for use. It will then be fine flour, quite warm, and the sand and it should be mixed together in the manner it is now generally done, only it should be worked by the spade or broad hoe, far better than is commonly done. Lime should be used as soon as possible after it is made up, for when it stands exposed for some time, it absorbs carbonic acid gas from the atmosphere, and again acquires some of the qualities it had before it was burned at all. The quality of sand is a very important item in making mortar. It should be clean and sharp and free from impurities. The quantity of sand to the lime, is also a very important item, but unfortunately for our American authors on Civil Engineering, they have rather compiled than experimented, hence we have only copies of foreign works on this subject. A common rule is two of sand to one of lime, but experience and close observation is required to determine this exactly, and nothing should be left to guess work. Common mortar, if good, adheres better to brick than stone. To make mortar into a good kind of cement, it is recommended to use brick dust mixed with the lime and sand, as a puzzolana. There is no doubt but what our masons are very sparing of cements and prodigal of sand, and there are good reasons for this. Landlords pay so high for their building lots, which have no inherent value in themselves, because they required little labor to make them, and they try to save all they can on the mason and architect's bills. Above all things it is prodigality to be saving in the foundation, walls or roofing of buildings. These parts, above all others, should be well constructed.

[Remainder next week.]

An Example for Builders.

The N. Y. Mirror, in the following paragraph, presents an example worthy of following in cities, where crowded thoroughfares render obstructions to a free passage dangerous as well as annoying. It says, in speaking of an improvement in that city:—The point which we wish to commend to the attention of builders is, the remarkable care shown in demolishing the buildings. Not a bit of rubbish has been allowed to remain in Nassau street, nor a brick even to obstruct the thoroughfare. In all the pullings down about town, we have never observed a more commendable instance of regard for the public safety and convenience. —[Phila. Ledger.

[We are sorry to say that the Mirror's paragraph is not true. Nassau street is now crowded up with bricks, rotten planks and mortar. It would be a good thing if some effectual remedy was devised for lumbering our streets with rubbish of old building materials, but we do not see how this could be done; we must be content to plod along in the old fashioned way, overlooking temporary street inconveniences for new improvements in building.

Who First Carried Coal from this Country to Philadelphia?

Much misapprehension has hitherto existed on this subject. It has been generally supposed that the coal first taken from Schuylkill County to Philadelphia was a wagon load at comparative great cost, by the late George Shoemaker, about the year 1820. This is not correct. As early as 1795, or thereabouts, Gen. Nichols, (father of the late Francis B. Nichols,) Gen. Arthur St. Clair, John Nicholson, and others formed a company to carry coal from Schuylkill county to Philadelphia, and about that time they freighted an ark with coal and took it to that city. It was deposited in the Potters' field, now Washington square, and there it remained for many years, a heap of "black stones," exciting the curiosity and jeers of the idle and "knowing ones," and a monument of the supposed folly of those who, it was thought, had exposed their ignorance by attempting to apply those "black stones" to any useful purpose.—[Min. Reg.

[We have heard it stated, that so ignorant were most people of the nature and value of anthracite coal, a few years ago, when some was presented to Prof. Mitchell for experimental burning in a common wood stove. —He declared it to be a most excellent substance for extinguishing the fire of the bottomless pit. *We* estimate this kind of coal at a far higher rate than any other kind, especially for domestic purposes.

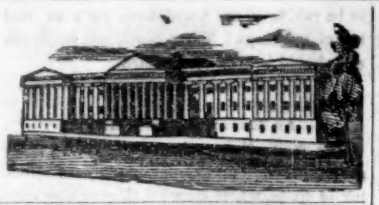
Advice about Caveats.

A case recently came under our notice where the Patent Office, refused to accredit the $20 paid for the Caveat fee towards a patent because the fee for Caveat was paid in as follows by a mistake:—the invention was the work of two individuals, but they thought it was all one whether the caveat was filed in one or both of their names, if the patent was applied for in the names of both. They applied for the patent in both of their names, and the *caveat* fee requested to be applied towards the Patent fee. This was refused, because the Caveat was in the name of one of the inventors only.

Chicago Mechanics' Fair.

The third Annual Fair of the Chicago Mechanics Institute, Ill., commenced on Monday of last week, and was highly creditable to that young but great North Western City,—the articles exhibited being of a very superior character, although not so numerous as the first Fair of this Institution. It is the general complaint against Mechanics Institutes that "they do not hold out—they want stamina and perseverance." We are sorry that such a complaint has its foundation in truth, but it has; this should arouse our mechanics to act energetically *always*.

M. Bodisco, the Russian Minister, whom Madam Rumor exiled to Siberia, arrived in the Cambria.



☞ Our weekly List of Patents and Designs contains every new Patent, Re-issue and Design emanating from the Department, and is prepared officially, expressly for the Scientific American, and for no other paper in the city, consequently other journals are obliged to wait the issue of the "Sci. Am." in order to profit by the expense to which we are subject, and of course must be one week behind. Those publishers who copy from this department in our columns, will, in justice to us, give proper credit for the same.

LIST OF PATENT CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending May 7, 1850.

To F. J. Austin, of New York, N. Y., for improvement in Printing Presses.

I claim the mode of governing the vertical motion of the type bed, by the conjoint application of the crank, and two part pressing bar, made as a hollow cylinder and slide, with stop shoulder, to give the upward motion, and pressure, and arranged to lengthen by sliding out at the back motion of the crank, and the combination therewith of the grooved cam, and backing bar, to regulate the descending motion of the type bed, substantially as herein set forth.

I claim the application of the rotating cams, to act through the fork, and connect or disconnect the clutches, to give the shaft, a rotary motion during half of the rotation of the shaft, and suspend the motion of the shaft, by the disk, and pins, on the fork, during the other half rotation so that the shaft goes two continuous revolutions to one intermitted revolution of the shaft, such intermitted revolution being applied to give an intermitted alternate motion to the double paper carriage in printing presses or to give any similar intermitted alternate motion by any competent means substantially as described.

I claim the crank, male wheel, fixed female wheel, and connecting bar, for the purpose of communicating the intermitted alternate motion to the double paper carriage, substantially as described and shown.

To E. R. Benton, of Milwaukie, Wis., for improvement in bran-dusters.

I claim the combination and arrangement of the interior stationary shell or cylinder, the intermediate revolving cylinder, covered in sections with wire-cloth of different qualities, and the central revolving cylinder, with the ventilator, for the admission of air, and the openings between the staves in the cylinder, for the emission of air to drive the flour and other stuff seperated from the bran, through the wire-cloth, the several parts, with their driving gear and apparatus, being constructed and arranged substantially in the manner and for the purposes set forth.

[See Engraving in No. 33, Vol. 4, Sci. Am.]

To J. Bogardus, of New York, N. Y., for improvements in the construction of the frame, roof, and floor of iron buildings.

I claim the method, substantially as described, of making the work of iron houses of more than one story by means of beams cast in sections with end flanches which receive bolts for uniting and drawing them together and with top and bottom parallel flanches, when this is combined with columns, plasters or posts cast with horizontal flanches at top and bottom, the top flanches of one column, and the bottom flanches of another being secured by bolts to the horizontal flanges of two beams, one column above and the other below, the point at which the beams are joined for the purpose and in the manner substantially as described.

I also claim the method, substantially as herein described, of making the floors by means of thin plates of metal formed with a groove on one edge and tongue on the other by riveting narrow strips of metal to their under surface and near the edges, the plates so formed being put together breaking joints, substantially in the manner and for the purpose specified.

I also claim the method, substantially as described, of covering the roofs of houses by means of series of thin metal plates, formed each with a groove on one edge, by riveting narrow plates or strips to the under surface thereof, that the edge of one plate may fit into the groove on the lower edge of the next above and so on throughout the series, substantially as described, when these plates are also provided with the lapping pieces or plates, riveted or otherwise secured to the upper surface of one end of each plate in each series to lap over the end of the contiguous plates of the next series, the said lapping pieces of each series being also made to lap one over the other, substantially as described and for the purpose specified.

To J. L. Cathcart, of Washington, D. C., for improvement in air-heating stoves.

What I claim is, 1st, a grate combined with and around the hollow cylinder through which the air passes and becomes heated.

Second, a conical hood placed above the air cylinder and the grate, and connected with a smoke pipe for the purpose of creating a draft, concentrating the heat and conducting off the smoke or gas from the burning wood or coal.

Third, the placing the grate on friction rollers as described, in connection with the cylinder for the purpose of clearing the grate of ashes or bringing any part of it under the operation of a stronger draft or current of air.

Fourth, the combination of the air pipes, or air passages with the hood as described, by which the air that has become heated in the cylinder is conveyed to the room or place to be warmed.

Fifth, the circular fender, which is also made to answer the purpose of a blower by being raised and connected with the hood as described.

Sixth, the method of introducing air into a hollow cylinder or air chamber connected with and inside of the grate and taking the air from beneath the hearth.

To C. C. Coolidge, (Assignor to F. Harrington & C. C. Coolidge) of Boston, Mass., for improvement in Bedstead Fastenings.

I claim the lip, in combination with the pawl and ratchet arc, substantially in the manner and for the purpose as described; and when the bedstead bottom is made of the said flexible strips having such a flexibility as to enable them to be readily wound upon the windlass and therefrom as stated.

To S. Davis, of Dartmouth, Mass., for adjustable mouth-piece to road-scrapers.

I claim combining with the body of a scraper, a mouth piece which can be adjusted to form various angles with the bottom of the scraper, substantially in the manner and for the purpose herein described.

To M. Delluc, of New York, N. Y., for improvement in mechanical leeches.

What I claim is first, the arrangement of the wire, of the button, and of the covering of the instrument, connected with the piston rod by the india rubber tube, which allows the cylinder, placed in the vacum produced by the piston, to work without admitting the air.

Second, the blades of the lancet shaped like a V.

R. De Massay, of Bocourt, France, for improvement in defecating Sugar.

I claim the process as described, for the immediate separation of the sugar from all foreign matter, which injures the purification, by the manner above set forth, by forming a solid saccharate of baryta pressing, decomposing and seperating the solid cakes and furnishing the process as set forth, to the almost total suppression of heat necessary to evaporation.

To P. Dorn, of Philadelphia, Pa., for improvement in Overshoes.

I claim an over shoe covering the front of the boot at the sole, substantially in the manner and for the purpose set forth.

To D. D. Gitt, of Butler Township, Pa., for improvement in Plow Cleaners.

I claim the combination of the lever, notched arm, and vertical wheel, with a conical roller placed under the beam and upon the cutter of the plough, as above described, for the purpose of operating the conical roller and cleaning the plow in the operation of ploughing, as set forth.

To J. R. Hyde, of Troy, N. Y., for improvement in cooking stoves.

I claim the mode herein described, of constructing fire boxes for stove, furnaces, &c., in two pieces, so that they are not confined as they are when made whole or in four pieces as described, but it is free to move on its bed plate.

Secondly, I claim the manner herein described, of dividing the sliding hearth of cook stoves in such a manner as to admit of its sliding under the stationary part, and be entirely out of the way; the whole being constructed in the manner and for the purpose substantially as herein described and represented.

To R. Montgomery, of New York, N. Y., for improvement in the screw excavator.

I do not claim a screw borer fer excavating earth, but I claim first, the employment of a screw exeavator combined with an adjustable tube as described, for the purpose of excavating and conveying off earth, said tube being placed at any angle or vertically, or horizontally as the case may require.

I also claim the apparatus for sustaining moving and guiding the excavator as above described, by which it is combined with the prime mover so as to be readily pointed in any direction, said apparatus consisting of a ring with shifting bearings and movable bearing for the shaft to rest in which is connected with the prime mover by universal joints.

To J. L. Mott, of New York, N. Y., for improvement in Cooking Stoves.

I claim the method of protecting boiler-covers against the injurious action of varying temperatures by combining therewith a lining made of metal so formed that in its cross section, it shall present a curved line, that is, a line longer than a straight line as described.

And I also claim the method of supporting the doors of stoves by means of a lever or levers so connected with the doors, substantially as described, that the said lever shall be moved in and out by the closing and opening of the doors, as described.

To W. R. Nash, of Bridgeport. Conn., for improvement in working a rotary and vertical churn-dasher.

I claim the application of the shaft, to communicate a vertical reciprocatory movement to the dasher, a rotary one to other dashers, so that either can be used as desired, as herein set forth.

To Wm. Pierpont, of Salem, N. J., for improvement in Straw-carriers.

I claim an elongated apron or pierced platform, hung upon and worked by cranks, connected with, and forming a part of the thrashing and separating machine, substantially in the manner and for the purpose herein described.

To C. Richardson, of Woburn, Mass., for arrangement of several slide valves in the same steam-chest.

I claim the arranging of two or more valves in the same steam chest to open and close the several steam ports or pasages leading to and from the cylinder of a steam engine, arranged and operated to gradnate the admission of steam into the cylinder of steam engines in the manner and for the purpose substantially as above set forth.

To Edme J. Leclaire & J. J. E. Barrnell, of Paris, France, for improvement in the manufacture of the Oxide of Zinc. Ante dated, Dec. 31, 1845. Patented May, 7, 1850.

We claim first, the use of a draft of air through the suction tubes, described above for oxidizing the metal and carrying forward the products and the arrangement of tubes or basins for the reception of the heavier portion of the products as described herein.

Second, the arrangement of the oxidizing chamber, in combination with the receiving chambers so as to allow the products, which they contain, to be gathered without entering the chambers.

To A. L. Swan, of Cherry Valley, N. Y., for improvement in the Melodeon.

What I claim is the employment of the arms, in combination with the top, of the bellows, in the manner and for the purpose set forth.

[See engraving of this in No. 29, Sci. Am.]

To T. C. Theaker, of Mansfield, Ohio, for improvements in Oscillating Valves of steam engines.

I claim the recess, sunk in the oscillating valve and communicating with the steam passage, in combination with the recess, formed in the valve chamber, the same acting in the manner and for the purpose herein specified.

To A. Walter, of Middletown, Ind., for improvement in machines for polishing stone.

I claim the manner or mode of giving a compound or double motion to the rubbers by means of two carriages, or a double carriage, each carriage moved by its respective cranks, substantially in the manner and for the purpose herein described, so that on motion of said rubbers will not interfere with the other motion, said machine can be propelled by any power now in use.

RE-ISSUES.

To E. Wilson, of Cincinnati, O., for improvement in the method of rendering Lard. Patented Oct. 9, 1844. Re-issued May 7, 1850.

I claim the above described apparatus for extracting or rendering lard &c., by the action of high pressure steam, is combining with a steam tight tank, substantially such as herein described, and provided with one or more discharge holes, for the discharge of the residuum, and with a perforated steam pipe at bottom for the introduction of high pressure steam, a perforated false bottom above the steam pipe to sustain the charge under the weight and pressure, substantially as described, to admit of and insure the free passage of the steam through the change, and also the free descent of the water of condensation as described.

I also claim in combination with the tank, substantially as described, the employment of one or more try cocks near the top thereof, and a regulating discharge cock at or near the bottom, substantially as herein described, for the purpose of ascertaining when too much water of condensation has accumulated and discharge the same, to retain a sufficient space above for steam to insure the passage of steam through the charge, as described.

And finally I claim in combination with a tank, substantially such as herein described, and for the purpose specified, the employment of a series of discharge cocks arranged at different levels, substantially as described, for the purpose of drawing off the rendered lard &c., as it floats on the water of condensation and thus insure the separation of the pure lard, &c., from all foreign substances, when this is combined with the relief or discharge cock, substantially as described.

To B. Holly, of Seneca Falls, N. Y., for improvement in Pumps. Patented June 5, 1849. Re-issued May 7, 1850.

I claim the combination of the nozzel with the pump barrel in such a manner that the nozzel can be readily changed from side to side and secured in any desired position, substantially as herein represented and described.

I also claim the manner of connecting the induction pipe, the valve, and its seat, with the base of the pump without the aid of rivets or solder, and in such a manner that when the base of the pump has been securely fastenened to a platform, the respective parts of the pump, as also the induction pipe, can be combined with the base or detached therefrom without disturbing its fastenings; to wit, by means of a cup rising from the centre of the base, which has a screw cut in its inner periphery and a hole in the centre of its bottom, through which hole the induction pipe, is inserted and enlarged by a mandrel; the metalic disk, placed within the said cup, with the tube, descending therefrom inserted into the upper end of the induction pipe, the leather disk, from the centre of which the valve is cut, placed on the disk, and the whole securely combined with each other by inserting the screw formed in the outer periphery of the lower end of the pump barrel within the screw thread formed in the inner periphery of the base cup, and turning the pump barrel until the lower end thereof forces the above enumerated parts into the position represented.

To S. Merrick, of Springfield, Mass., for improvement in Feeders for Screw Machines. Patented March 7, 1846. Re-issued May 7, 1850.

I claim first, the method substantially as described, of arranging screw blanks, &., by the motion of oppositely inclined bevelled or curved surfaces with sufficient space between them to receive freely the shanks of the blanks whilst they hang suspended by heads, the said motion of such surfaces being in the direction

of the space between them, substantially as described.

Second, making one of the said inclined bevelled or curved surfaces in two parts, one above the other, substantially in the manner and for the purpose specified.

Third, combining with the said oppositely inclined bevelled or curved surfaces a fence or guard plate placed across from the one end towards the other and over the space in which the blanks are suspended, substantially in the manner and for the purpose specified.

Fourth, in combining with oppositely inclined bevelled or curved surfaces, revolving arms, wings or beaters, substantially in the manner and for the purpose specified.

And lastly, in combining with the said oppositely inclined bevelled or curved surfaces, revolving arms, wings or beaters, substantially in the manner and for the purpose specified.

TO CORRESPONDENTS.

"P. C., of Conn."—A wrought iron tube is the new Britannia Bridge, of Stephenson. We believe that your bridge would be a good one, but we do not see how a patent could be secured for it; but we certainly like your ideas.

"H. R., of N. Y."—We believe that your plan for drying the sawdust would pay you well for the extra expense. Use copper tubes. We know of no second-hand tools for sale such as you describe.

"A.S.L., of ——."—We believe that a bell and wire for every room would be as cheap and answer a better purpose than the plan described by you.

"E. S. H., of N. Y."—We do not see how your air engine could drive machinery. It cannot do it that we can discover.

"N. W. W., of Phila."—You must first study algebra, geometry and other branches of mathematics, to be proficient, but you will find Mahan on Civil Engineering the best for that branch, then Gregory's Mechanics. This latter book will assist your whole course.

"J. E., of C. W."—We do not purchase rights. We will notice the ice making machine when warm weather arrives. Mr. Wise's book on balloons is a capital one—the best ever published.

"F. J. P., of N. Y."—We have seen so many engines of the rotary kind, and some of those using the steam expansively, that we have no hope of their success in competition with the reciprocating kind. Nothing but a practical refutation will satisfy us. We will take your advice about the name of engineer—but we like the *stoker* best, and so far as a *correct name* is concerned, the wheel is no more a driver than the *driver* is a wheel. The steam is the driver. The price of the cuts will be $10."

"A. H., of N. Y."—The glass must be ground.

"H. J. W., of Tenn."—The Livingston Patent means a grant of land made by the British Government to Robert Livingston, long before the Revolution.

"J. S., of Ohio."—As you say, it would be well if the papers you mention would take their information from us first, instead of second hand, as the 'F— and M—' does.

"J. W. S., of N. Y."—You had better make out a suitable advertisement of your drill and forward it on. The one sent is too long as you will see from our advertising terms.

"S. S. S., of N. Y."—The employment of a ratchet for tightening bed cords is very old, at least ten years, and is in almost universal use. No patent could be obtained for it.

"C. A. M., of Ind."—Ether in chemistry is a volatile fluid produced by the distillation of alcohol with an acid. It is sometimes distinguished as sulphuric ether from the mode of preparing it, but when well rectified the ether is the same, whatever acid has been employed.

"H. T. P., of S. C."—Your letter of the 7th inst. is received, and will be attended to at an early day. We did not understand until now that you wanted both lathes.

"D. L. B., of Ill."—By referrence to No. 15 of the present Vol. Sci. Am., you will find a machine illustrated and described possessing all the distinguishing features of your invention. We see nothing new in the devices represented in your drawings, and advise you not to spend money upon an application.

"J. E., of Coburg."—We cannot supply you with the first 26 numbers of Vol. 5.

"P. H. D., of N. C."—You had better communicate with some members of the Assembly in regard to the utility of your ideas. They will be better able to advise you upon that point. We could advise you in regard to its novelty, by examining a working model.

"R. E. of Phila."—We do not care about purchasing your volumes, as it is no object for us to have merely one or two Vols. on hand.

"G. P., of Md."—You will see that the profit of your club does not fall to us exclusively as you obtain them through our agents.—We are not justified in offering inducements, while the profit of them fail to reach us. This is the true state of the case.

"S. G., of Ga."—The only way to prepare the saw dust is to mix it with coal tar, but the apparatus for that purpose you can see in the Sci. Am. of last week.

"J. Y., of Phila."—We were unable to answer your letter satisfactorily in season for this number, but will endeavor to do so by letter.

"C. D. & T. L. V., of Pa."—$20 was received from the Patent Office for you, a few days since, which we have credited to your account.

"S. C. R. of Ohio."—There are file cutting machines in use, that we know of. We cannot tell the difference between yours and others unless you either furnish a well described drawing or model.

"W. B. K., of Mass."—Your specification was duly received, with funds, and has been forwarded to the Patent Office with drawings. An engraving of your invention, published in the Sci. Am., will cost you $5; the engraving, after being used by us, will be subject to your order.

Money received on account of Patent Office business, since May 7th, 1850:—

J. C. W., of Pa., $28; O. C., of Ill., $20; C. S. T., of N. H., $30; C. F. B., of R. I., $30; T. T. W., of Conn., $25; J. J. J., of Tenn., $50; J. R. of O., $40; A. W. C., of N. Y., $25; A. L., of Conn., $35, and W. B. K., of Mass.. $10.

Notice

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

ADVERTISEMENTS.

Terms of Advertizing.

One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements must not exceed 16 lines, and cuts cannot be inserted in connection with them for any price.

Scientific Museum.

For the Scientific American.

Success in Invention.

Sir James Mackintosh says, that were a prize to be offered for the best translation of the Greek Bible, and were there not a Yankee in the world who could read Greek, still he would learn the language and carry off the prize! Enterprise is the trait of character for which we are so much distinguished; and industry lies at its foundation. Perseverance, diligence and industry are essential to success; and this is true, not only in literature, but in the application of "Divine axioms" to the purposes of life. Success in any scheme depends on patient, untiring application. In any undertaking, less reliance should be placed on genius and other accidental things, and more upon the exercise of a diligence which never grows tired or discouraged. "Wishing, and sighing, and imagining, and dreaming of greatness," says Wirt, "will never make you great. If you would get to the mountain top, it will not do to stand still, looking and admiring and wishing you were there. You must gird up your loins and go to work with all the indomitable energy of Hannibal scaling the Alps." Why is it that a few, who have devoted themselves to Science and Art, have risen to such eminence? Some will say, it is genius, a faculty for invention implanted within them; that Nature has been partial and endowed them with peculiar gifts. To show the true cause of their prosperity, we will cite a few examples from the pen of Dr. Taylor, of Dublin:—Cultivated habits of observation and persevering industry were the great elements of Smeaton's success: they were formed in his boyhood, and were not abandoned in his old age. The life of Franklin affords signal proof that moderate talents judiciously directed, when aided by industry and perseverance, will give one a claim to the homage of posterity. His industry and temperance were the sources of his early success; and his philosophical discoveries were the result of patience and perseverance. The great characteristic of Arkwright's mind, and the principal source of his success, was his indomitable perseverance. Sir Humphrey Davy was one of the few men who united the vigorous imagination of a poet to the patient research of a philosopher; he was equally fertile in invention and patient in investigation.

James Watt.

A young man, (says Sir R. Kane,) wanting to sell spectacles in London, petitions the corporation to allow him to open a little shop, without paying the fees of freedom, and he is refused. He goes to Glasgow, and the corporation refuse him there. He makes acquaintance with some members of the university who find him very intelligent, and permit him to open his shop within their walls. He does not sell spectacles and magic lanterns enough to occupy all his time; he occupies himself at intervals in taking asunder and re-making all the machines he can come at. He finds there are books on mechanics written in foreign languages; he borrows a dictionary, and learns those languages to read those books. The university people wonder at him, and are fond of dropping into his little room in the evenings, to tell him what they are doing, and to look at the queer instruments he constructs. A machine in the university collection wants repairing, and he is employed. He makes it a new machine. The steam-engine is constructed; and giant mind of Watt stands out before the world—the author of the industrial supremacy of this country, the herald of a new force of civilization. But was Watt educated?—Where was he educated? At his own workshop, and in the best manner. Watt learned Latin when he wanted it for his business. He learned French and German; but these things were tools, not ends. He used them to promote his engineering plans, as he used lathes and levers.

A Diminutive Plant.

A Homœpathic phial will hold a dozen of duck weed plants, root, stem, fruit, and everything.

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[Continued from page 272.]

MR. EWBANK'S (COMMISSIONER OF PATENTS) EXPERIMENTS.

FIG. 48. FIG. 49.

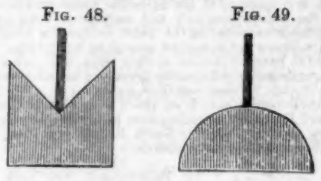


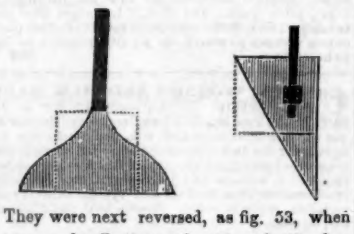
Fig. 49. was a semicircle. Mr. B. undertook to test these. They turned the boat in circles varying (from light winds and tides) from 30 to 150 feet. Four were thought equal, and sometimes superior, to eight of fig. 40. It is demonstrable that these blades are less effective, though in a very small degree, than those marked fig. 44 and, when reversed, more powerful than fig. 41.

Fig. 50 is formed as represented but not tried, as it was evident their value would be nearly that of fig. 44, probably a shade above them, but two minute to be detected, except in perfectly still water.

Fig. 51 is a right-angled triangle, 7 inches across the top, and ending in a point nearly 14 inches below it. These were, as might have been anticipated, more effective than those of fig. 40. "Everything about them," observed Mr. B., "shows their superiority." They of course, entered the water without jarring.

The same were attached to the arms in the position of fig. 52, and were unable to compete with fig. 40. The latter had a slight advantage over them.

FIG. 50. FIG. 51.

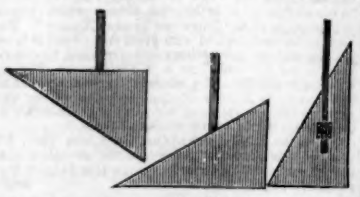


They were next reversed, as fig. 53, when they proved effective as fig. 44, and 49—four being equally so as the eight opposed to them.

There finally changed to fig. 54, when the boat was turned so rapidly, as to make it difficult, with a wide ore, to keep her in one direction. Four were removed, and then she described a circle in less than 50 feet. Two more taken away, leaving only a couple to act against the eight on the other wheel, and to which they proved equal.

From these experiments, it appears that, with equal areas, and equal dip, triangular blades may be rendered twice as effective as ordinary rectangular ones. This is made manifest by figs. 44, 49, and 53,—four of the former equalling eight of the latter. And this, too, while the propelling surface of the smaller number was half that of the greater; for the four were as long in making a revolution, as were the eight. Hence, the speed of a boat may be increased by diminishing the number of her paddles—a fact still further elucidated by fig. 54.

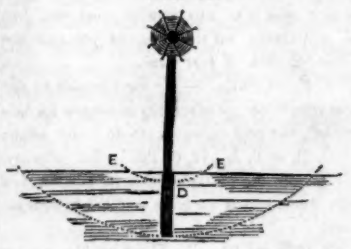
FIG. 52. FIG 53. FIG. 54.



There can, I think, be little doubt, that the greater the velocity of a steamer's wheels, the fewer (within certain limits) should be the blades; and that, at the rate at which some of our boats go, the number might be reduced with advatage. Some have three, others four, and in more than one vessel, without any load on board, I have seen six submerged at each wheel. In these cases, is it not evident that each blade, on entering, plunges, not, as it ought, in water undisturbed, but into that which preceeding ones have already broken up and set in motion towards the stern? It would seem that one in the act of plunging, another sweeping under the shaft, and a third leaving the surface, are all that are necessary to be kept up; and that a great number, as regards the speed of a boat, is positively injurious. Yet under a vague idea of attaining a higher speed, the number of paddles has frequently been nearly doubled.

Snow, as every person knows, causes the wheels of land locomotives to slip upon, instead of rolling over, the rail. They revolve as usual, but the carriages make little progress, hence much of the power spent on them is expended to no purpose. So it is with paddle-wheels: a boat never progresses in the ratio of their revolutions, because of the yielding medium in which, and against which, they act. They slip always—a result, to some extent, inevitable when massive solids wade through fluids. The distance between the Atlantic

FIG. 55.



steamers' docks, in Liverpool and New York, has been calculated at 3023 miles, but their paddles, in each trip, pass over a space varying from 5000 to 8000 miles. In steamers unaided by sails, the disproportion is often greater. Now can this be modified, by giving the paddles a better hold on the fluid they sweep through.? The experiments with blades 42, 43, 44, 45, 46, 48, 49, 51, 53, and 54, furnishes replies to the interrogatory.

The moral of the foregoing experiments is this:—As the propelling power of a paddle is greatest at its lower or outer extremity, and diminishes to nothing at the surface, so its face should enlarge with the dip, and be nothing, or next to nothing above. Let D, fig. 55, represent the end of an ordinary blade, or paddle. Its upper part barely touches the water, and only for the moment it is in the position shown. But suppose it were immersed to the line C C,—say four or five inches—it would even then be no sooner under, than above the surface again, so brief would be its immersion. The lower edge in the meanwhile, would sweep along the extended curve there delineated.

Human Strength.

An active man, working to the best advantage, can raise 10 lb. 10 feet in a second for 10 hours in the day, 100 lb. one foot in a second.

Absolute force of pressure with the hands was found by the dynanometer of Regniel to be on an average equal to 110 lbs. Absolute force of a man lifting with both hands 286 lbs. Greatest average load which a man can support on his shoulders, for some seconds, is estimated at 330 lb.; and it is supposed that he can exert the same force in drawing vertically downwards.

The mean absolute force of a man, in drawing or pulling horizontally is found by the dynanometer to be 110 lbs.; the force of the pull in the strongest man was found to be only 20 lbs. more than the average.

The greatest effect of man's strength in raising a weight will be when the weight of the man is to that of his load as $1 : - + \sqrt{3}$, or nearly as 4 : 3.

Table of Horse Power at Different Rates of Speed.

Let us suppose 15 to represent the greatest unloaded speed, and the square of 15, or 225, to represent the greatest load which can be sustained without moving; the following table gives for each degree of speed, from 1 to 15, the corresponding load and useful effect:—

Speed	0	1	2	3	4	4	6	7
Load	225	196	169	144	121	100	81	64
Effect	0	196	338	432	484	500	486	484
Speed	8	9	10	11	12	13	14	15
Load	49	36	25	16	9	4	1	0
Effect	392	324	250	176	108	52	14	0

Thus, if the greatest unloaded speed of a horse be 15 miles an hour, and the greatest weight he is capable of sustaining, without moving, be divided into two hundred and twenty-five equal parts, his labor will be most advantageously employed if he be loaded with 100 of those parts, and travel at the rate of 5 miles an hour. If he be thus employed it will be found that he will carry a greater weight through a distance, in a given time, than under any circumstances.

A horse, upon a well-constructed railroad, can draw 10 tons at the rate of 2 miles per hour, or 5 tons 4 miles per hour.

The absolute force of the horse drawing horizontally is, on average, 770 lb. From various calculations it would appear when the period of continuance is made an element in the calculation, that the power of a horse working eight hours a-day is on an average not more than an equivalent to that of five men working 10 hours; the most useful mode of applying a horse's power is in draught, and the worst is in carrying a load; it has been found that three men carrying each 100 lb., will ascend a hill ascend a hill with greater rapidity than one horse carrying 300 lbs. The best disposition of the traces in draught is when they are perpendicular to the collar.

When a horse is employed in moving a machine in a circular path, the diameter of this path should not be less than 25 or 30 feet; 40 feet would be better than either.

LITERARY NOTICES.

Parts 1, 2 and 3 of Mr. Gleason's great "Mistake of a Life Time," in paying three thousand dollars for the manuscript of Waldo Howard, Esq.'s, "Robber of the Rhine Valley," has been laid under our olfactories by Messrs. Dewitt & Davenport, Tribune Buildings. The cover is richly embellished with ships, flat-boats, war implements, Neptune in his chariot, horses, cable chains, and children in arms, weaving together such scenes and pictures as form a beautiful panorama, depicting life as fancy hath reflected it—the scene being drawn but *not* colored after nature herself. Price 12 1-2 cents per No.—the end not yet.

We are indebted to Messrs. Berford & Co., Astor House, for the May No. of the Scalpel. It contains a valuable and interesting contents, as usual, after the peculiar, brilliant, and go-ahead style of the Editor, Dr. Dixon. The article upon Hysterics is able, and worthy of a careful perusal. This journal, when fairly brought to the intimate acquaintance of the American people, must stand out as prominent here as the famous London Lancet does in Europe.

Messrs. Hotchkiss & Co., of Boston, have just published an interesting work, called "Evelyn, the Child of the Revolution: by Mrs. Robinson." Price 25 cts.; for sale by Dewitt & Davenport.

No. 15 of Messrs. Phillips, Sampson & Co.'s edition of Shakspeare's Dramatic Works is issued. It contains the "Comedy of Errors," in which the two Dromio's figure so comically. For sale by Dewitt & Davenport.